

Work Practice, Learning Worker Characteristics and Informal Learning

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This study explores which work practice and learning worker characteristics relate to different kinds of informal learning. Informal learning is viewed as an integrated process consisting of an interaction process between learning workers and interaction partners and an internal psychological process, leading to an outcome. A sample of 279 police officers filled out a questionnaire. Preliminary analysis shows that external input, collegial availability, valuing informal learning, police tenure and hours spend on jobs besides police work predict informal learning.

Keywords: Informal Learning, Work Practice, Learning Worker

Whether and how people learn at work is influenced by how work practices 'invite' employees to learn at work (Billett, 2002). The type of workplace activities that individuals are able to engage in and their access to guidance is central to their learning. Both have consequences for the knowledge individuals construct through work. Interest and recognition of the importance of the work practice as learning environment has grown recently in HRD literature (Bolhuis & Simons, 1999; Eraut, 2000; Onstenk, 1997; Simons, Linden van der, & Duffy, 2000), although the body of empirical literature is less profound (Eraut, Alderton, Cole, & Senker, 1998; Kwakman, 1999; Woerkom, 2003). Especially, informal learning that happens without involvement of educational providers in the work practice lacks researcher's attention and empirical grounding.

The close relationship between working and learning make it difficult to recognise learning separately from working since in most cases working and learning are intertwined (Eraut, 2000). Informal learning may happen by carrying out tasks, following personal interests, setting rather undetermined career goals, solving problems or trying to develop something further. Learning is situated in the activity in which it takes place (Wenger, 1998).

Informal learning is therefore defined as all learning that does not take place within, or follows from a formally organised learning program or event and often happens implicitly through work activities (Eraut, 2000; Marsick & Watkins, 1990). More specifically, we approach the nature of informal learning in this study as an integrated process consisting of an interaction process between learning workers and their interaction partners and an internal psychological process leading to an outcome (adapted from Illeris, 2002). In order to pursue the goal of the study, the psychological process is operationalized in terms of learning worker's 'intentionality' and the interaction process as 'developmental relatedness'. We will further elaborate on these concepts of informal learning in order to provide a descriptive typology of informal learning. Finally we select work practice and learning worker characteristics that may predict differences in informal learning. The purpose of this paper is to explore which selected work practice and learning worker characteristics relate to informal learning at work.

Informal Learning: Intentionality and Developmental Relatedness

We apply the concept of intentionality as one part of the integrated process of informal learning, where it refers to whether or not learning workers are consciously and internally initiated engaged in activities pursuing a learning outcome. According to cognitive psychological notions, intentionality refers to whether an act of will, of which the individual is aware, is a necessary condition to put the process in motion: that is to start it (Bargh, 1996). The idea that informal learning may or may not be triggered by intentions is grounded in the work of several authors on learning at work that hold related notions (Bolhuis & Simons, 1999; Coffield, 2000; Eraut, 2000; Marsick & Watkins, 1990; McCauley & Hezlett, 2001; Megginson, 1996).

Learning worker's intentionality may be spontaneous or deliberate. Spontaneous learning happens in those activities that are performed with another goal in mind than to pursue an opportunity to learn. Learning outcomes emerge or may be unexpected and can be described as by-products, discoveries, coincidences, or (sudden) realizations. Sometimes the learner may remain unaware of the changes, for example when there was no reflection (Marsick & Watkins, 1992). Deliberate learning on the other hand refers to those activities that are performed with the goal in mind to pursue an opportunity to learn. Learning outcomes are planned, sought for and sometimes calculated.

We apply the concept of developmental relatedness as the other part of the integrated process of informal learning, where it refers to whether learning worker outcomes result from direct or indirect social interaction. If there was direct interaction we further distinguish whether learning outcomes were generated for the learning worker solely or for his/her interaction partner(s) as well. From a constructivist perspective, social interaction is at the core of the developmental process and individual cognitive development is a process constructing a personal understanding of relevant structures of meaning derived from action (Fenwick, 2000). In this developmental process interaction partners do not necessarily play an explicit role of being a learner or developer; learning outcomes are a result of interactions while working (Marsick and Watkins, 1990). We discern three different kinds of developmental relatedness: 'learning individually', 'learning in interaction with others', and 'learning together'. The first kind of developmental relatedness is when an employee and others indirect social interaction that contributes to learning outcomes through media and artifacts, such as when workers pick up a manual to study a topic. The second kind of developmental relatedness is when workers learn through interaction with other people at work and this contributes to their learning outcomes and not necessarily to the development of their interaction partners. Of course there may be learning outcomes for the interaction partner(s) as well, but they remain outside awareness of the individual learning worker. In that sense there is a one-way developmental relation. The third kind of developmental relatedness is when learning workers and their interaction partner(s) both contribute at the same time to each other's learning outcomes and therefore both benefit from the interaction (see also D'abate, Eddy, & Tannenbaum, 2003). In that sense there is a two-way or mutual developmental relation. Learning together may happen in a group of people and be task oriented or driven by a shared interest (De Laat & Simons, 2002; Van der Krogt, 1998). Interaction partners fulfill the role of learner and guide in which they offer each other knowledge, e.g. in brainstorming about a work related topic. This sharing and negotiating of knowledge is often implicit but more and more recognized as an important asset for the organization (Senge, 1990; Watkins & Marsick, 1993). Learning together may also happen in an exchange between two colleagues who both have something to give, in which the other is interested.

In learning from others we further distinguish the location and the hierarchical level (Levy, Collins, & Nail, 1999) of the interaction partners (D'abate et al., 2003). The organizational location refers to whether the interaction partner is in the same organization as the learning worker (internal) or in a different organization (external). The hierarchical level refers to the social status of the learning worker in relation to the interaction partner; the status can be lateral (e.g. peers, team mates), downward (e.g. learning worker is at a lower hierarchical level), or upwards (e.g. learner is at higher hierarchical level). The reason for doing this, is that it is assumed that learning happens through the possibility to be involved with a variety of interaction partners in different kinds of social networks (Wenger, 1998). People in different positions within the vocational practice provide different potentials in employees zone of proximal development (Vygotsky, 1978).

The combination of intentionality and developmental relatedness provides a descriptive typology of informal learning different kinds of informal learning. We view informal learning on a micro level as a single developmental interaction (D'abate et al., 2003). In Table 1 illustrative examples are listed.

Table 1. *Typology of Informal Learning Based on Intentionality and Developmental Relatedness*

Informal learning	Individually	From others (people outside police vocation, peers, experts and novices)	Together
Deliberate	Searching for specific information in book	Reflecting on work experience with help interaction partner	Working together on a multi-disciplinary project
Spontaneous	Building up routine	Receiving unasked feedback from interaction partner	Unexpected insights in discussion with interaction partner(s)

Work Practice and Learning Worker characteristics for Informal Learning

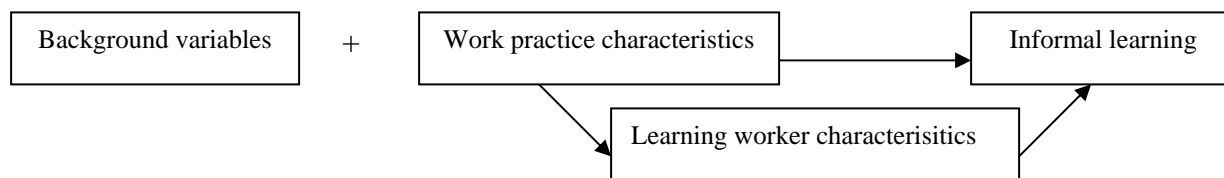
It is recognized by many scholars that learning at work is best understood through examining the relationship between work activities, the cultural and social relations of the workplace and the experience and social world of the participants (Evans & Rainbird, 2002). Billett (2002) addresses in this respect that workplace experiences are a product of the historical-cultural practices and situational factors that constitute the particular work practice, which in turn distributes opportunities for participation to individuals or cohorts of individuals. That is, they shape the conduct of work and learning through these practices.

Consequently, we question the relations between work practice and individual learning worker characteristics and informal learning. Based on previous work on workplace conditions six characteristics of the work practice were selected that may influence work-related learning and are shown in Figure 1. Managerial support in terms of

encouragement and facilitation of resources stimulate work-related learning as well as the availability of knowledge and knowledgeable colleagues do (Billett, 2002; Eraut et al., 1998; Kwakman, 1999; Onstenk, 1997). Furthermore the kinds of practical work activities people perform in terms of task complexity, variation and autonomy influence learning (Billett, 2002; Ellström, 2001; Kwakman, 1999; Onstenk, 1997; Straka, 2000). Based on previous empirical work, it is assumed that these work practice characteristics stimulate informal learning (Kwakman, 1999; Straka, 2000; Woerkom, 2003), whereas work pace would inhibit informal learning (Kwakman, 1999).

Beyond the opportunities of the work practice is the ‘agency’ of the individual, which determines whether and how individuals learn through work. ‘Ultimately, individuals’ learning may always be in some way unique to their personal histories, which are shaped socially through variations in and complexes of historical, cultural and situational factors encountered throughout life histories’ (Billett, 2002). Individual learning worker characteristics are depicted in Figure 1 and refer to experience of competence, valuing learning at work and experience of social integration with management and colleagues (Deci & Ryan, 1985; Kwakman, 1999; McCauley & Hezlett, 2001; Straka, 2000). This study attempts to find out which selected work practice and learning worker characteristics relate to informal learning at work?

Figure 1. Predictors for Informal Learning



Methodology

Sample

A sample of 279 Dutch police officers filled out a questionnaire voluntary. Table 2 outlines some of their descriptive characteristics. The police organization was chosen as particularly applicable for their explicit hierarchical levels and their current innovation efforts toward HRD practices in informal learning at work.

Table 2. Description of Respondents (N= 279)

Respondent characteristics					
Non-police education	Primary	5	Police education	Junior	21
	Junior general secondary	74		Senior	233
	Junior vocational secondary	104		Higher	23
	Senior general secondary	79	Police organization	Rural 1	50
	Higher professional	17		Rural 2	53
Job classification	Managerial	51		More urban 3	30
	Non-managerial	226		More urban 4	67
	Missing	2		More urban 5	33
Gender	Female	66		Urban 6	18
	Male	213		Urban 7	28

Instrument

A survey study was supposed to be an appropriate way to address the research questions, because quantities provide a means to capture large amounts of data over a wide range of possibilities. In addition, a standard instrument made it possible to conduct the study in different organizations.

Several attempts have been made to determine the nature and extent of informal workplace learning with help of a questionnaire (Kwakman, 1999; Megginson, 1996; Rowden, 2002; Woerkom, 2003). Some authors examine learning strategies as derived from educational literature and apply this in an organizational context. Others applied a perspective on workplace learning in which learning and working are integrated that is comparable to ours. Megginson (1996) for example introduces emergent and planned learning. Emergent learning represents a strategy, an approach to experience as an ‘unpremeditated exploration’ (p. 417). Emergent learning was measured in a survey by items as, ‘It is important to be open to experience then learning will come’, ‘Most of my new learning emerges

unexpectedly from things that happen', whereas planned learning was measured in the same survey by items as, 'I set goals for my own learning', 'I regularly prepare a learning contract, development agreement or continuous professional development statement outlining my plans.'

In our view, these attempts provide useful inspiration to our specific choice to view learning based on intentionality and developmental relatedness. A questionnaire was developed based on a previous qualitative study with police officers by Doornbos, Bolhuis and Denessen (in progress). This study revealed a rich variety of instances of informal learning. Making every attempt to stay as close as possible to the language and references used by police officers, a survey was developed to capture informal learning accurately. Once developed the informal learning part of the 'Learning from Police Work Questionnaire', was subjected to critique sessions by content area experts and 25 police officers to ensure validity.

Informal learning at work consisted of 50 items referring to twelve a-priori subscales based on the informal learning typology (Table 1); 'spontaneous individually' (4 items, e.g. in preparing a task I find answers for another problem) and 'deliberate individually' (4 items, e.g. I try out a new application independently) 'spontaneous from people outside the police vocation' (4 items, e.g. people outside the police organization contributed unexpected to new insights) 'deliberate from people outside the police vocation' (4 items, e.g. I discuss a work situation with friends to find out how they think about it), 'spontaneous from peers' (4 items, e.g. In a meeting with a colleague, we suddenly reached shared insights on something), 'deliberate from peers' (4 items, e.g. I deliberately watched a colleague to follow his/her example), 'spontaneous from experts' (5 items, e.g. I spontaneously picked something up from a conversation with a more experienced colleague), 'deliberate from experts' (5 items, e.g. In accomplishing a task I made use of the knowledge of more experienced colleagues), 'spontaneous from novices' (4 items, e.g. I noticed that I started to think different about a subject by the contribution of a colleague who just started his work at the police), 'deliberate from novices' (4 items, e.g. I talked to a less experienced colleague to generate new ideas), 'learning deliberately together' (4 items, e.g. . All items refer to activities.

Work practice characteristics consisted of 46 items referring to six subscales 'task variation and chances' (8 items, e.g. I have variation in my job), 'task autonomy' (8 items, e.g. I have freedom in the way I perform my job), 'external input' (9 items e.g. I receive constructive feedback on my work from my colleagues), 'collegial availability' (6 items, e.g. my colleagues are available to help me out on something), and 'managerial support' (11 items, e.g. My manager encourages me to unfold initiatives).

Learning worker characteristics consisted of 24 items referring to four subscales; 'social integration with colleagues' (5 items, e.g. I feel allied with my colleagues), 'social integration with manager' (5 items, e.g. I have a good understanding with my manager), 'experience of competence' (8 items, e.g. I am satisfied with the way I perform my work) and 'valuing learning at work' (6 items, e.g. I believe that I, as a police officer, have to think about my personal development).

Work practice and learning worker characteristic scales were partially adapted from the Dutch Institute of Working Conditions (Veldhoven & Broersen, 1999) and were tested in a previous pilot study with 92 police officers. Responses for informal learning and work practice characteristics were provided on a seven-point Likert-type scale with the following choices: (0) never, (1) once a year or less, (2) once a month or less, (3) a few times per month, (4) once a week (5) a few times per week (6) every day. Responses for learning worker characteristics were provided on a 5-point Likert-type scale with the following choices (1) strongly disagree, (2) disagree, (3) do not agree/disagree, (4) agree, and (5) strongly agree. Reliability analyses of the work practice and learning worker characteristics showed that 3 items would raise Cronbach's Alpha if deleted from the scale.

Data analysis

Reliability analyses were conducted on the twelve new developed informal learning scales. Cronbach's Alpha's appeared to be rather low. Therefore, exploratory factor analyses were conducted as well. These were conducted in SPSS using principal component (PC) extraction and Varimax rotation. The selection process for the factor solution was based on interpretability based on constructs in the typology of informal learning (Table 1) and variance accounted for. Items that loaded about at least .50 in a factor and maximum .35 in another were included in scales of informal learning. Scree plots were also used to get an initial indication of the approximate number of factors to extract. Reliability analyses were conducted for all measures. Pearson's r was computed as correlations coefficient between the informal learning scales. Level of significance was set as $\alpha = .05$. Multiple regression analysis was used to determine the influence of the work practice and learning worker characteristics on different types of informal learning. Regression assumptions and multicollinearity were evaluated. The stepwise method was used because of the exploratory nature of the analyses aimed at determining the relevance of the many independent variables.

Findings

Exploratory factor analysis of the informal learning items showed five factors and were identified as *learning in interaction with peers (LP)*, *learning together (LTo)*, *learning individually (LInd)*, *learning in interaction with novices and people outside the vocation (LNO)* and *learning from experts (LE)*. Together they explain 56% variance. Table 2 shows the results. The intercorrelations among the five types of informal learning (see Table 3) indicate a positive relationship between all measures.

Table 2. *Exploratory Factor Analysis of Informal Learning Items*

	1	2	3	4	5
Looking back on a situation and determine what went well and what could be improved	.74	.13	.19	.12	.01
Asking questions and searching for answers	.67	.10	.23	.13	-.01
Deliberately watching a colleague to follow his/her example	.67	.21	-.01	.21	.30
Looking for information on a specific subject	.65	-.01	.25	-.12	.00
Reflecting on a situations to learn from and ask colleague's opinion	.62	.22	.13	.33	.11
Summarizing and contribute to understanding	.62	.34	-.11	.15	.19
Asking colleagues questions to find out about something	.60	.24	-.01	.01	.27
Asking professional colleagues to help you with something	.60	.24	.27	.17	.25
Telling about a work situation you have been in and ask how a colleague how he would have acted	.58	.30	-.01	.01	.41
Watching a new colleague and notice that you could do that in the same way	.20	.63	.11	.23	.18
People outside police organization contributed to new insights	.22	.63	.18	-.12	.23
Deliberately watching colleagues that are less knowledgeable	.39	.62	-.01	.11	-.01
A comment of an external partner was suddenly instructive	.41	.62	.24	.00	.15
Talking to a less experiences colleague to generate new ideas	.34	.62	.18	.16	-.01
Discussing with less experienced colleagues about a solution to a problem	-.01	.60	.13	.43	-.01
Receiving an annoying response and suddenly understand something	-.01	.59	-.01	.22	.21
Asking for suggestions from local residents	.32	.56	.39	-.18	-.01
Starting to think different about a subject by the contribution of a colleague who just started his work at the police	-.01	.56	.14	.39	.19
Discuss a work situation with friends	.24	.55	.25	-.00	.23
In the preparation for one task find answers for other task-related problem	.12	.16	.73	.01	.28
Try out a new application independently	.26	.16	.69	.22	.22
Choosing work that gave me opportunity to broaden my horizon	-.01	.16	.65	.15	.00
Scrutinize your personal performance and reflect on what you think about it	.34	.01	.51	.36	-.11
As a result from a discussion with colleagues we formulated a collective point of view	.15	.14	.01	.62	.00
In brainstorming about a mutual problem we spontaneously learned from each other	.36	.10	.33	.60	.15
In meeting with colleague suddenly reach shared insights on something	.12	.17	.20	.59	.37
In accomplishing a task I made use of the knowledge of more experienced colleagues	.24	.15	.12	.00	.77
Ask something to colleague and coincidentally run into something else that is interesting for your work	.12	.16	.20	.21	.67
Coincidentally get the hang of something from an experienced colleague	.32	.01	.23	.51	.54

Table 3. *Informal Learning Correlation Matrix*

	LP	LNO	LInd	LTo
LDIP	1.00			
LINO	.661**	1.00		
LIND	.442**	.487**	1.00	
LTOG	.486**	.498**	.541**	1.00**
LFE	.578**	.460**	.460**	.528**

** Correlation significant at the 0.01 level (2-tailed)

Table 4 shows the distribution and reliabilities of the key measures. Mean scores show that work practice characteristic task variation is perceived to be applicable almost a few times a week, whereas task autonomy and

collegial availability are perceived to be applicable at least a once a week. Police officers experience work pace more than a few times per month. External input and management support are applicable less than a few times per month. Averagely all respondents agree with statements that refer to valuing learning at work. Responses on the informal learning scales show that learning from experts, in interaction with peers, together and individually happens between once a month or less and a few times per month, whereas learning in interaction with novices and outsiders happens between once a year or less and once a month or less.

Table 4. *Descriptive Statistics and Reliabilities of Key Measures*

	N	M	SD	Number of items	Coefficient Alpha
<i>Work practice characteristics</i>					
Task Variation	263	4.57	0.89	7	.78
Collegial Availability	270	4.41	0.93	6	.73
Task Autonomy	261	4.33	1.04	8	.80
Work pace	271	3.26	1.22	4	.69
External Input	255	2.85	0.93	9	.72
Management Support	258	2.29	1.20	11	.92
<i>Learning worker characteristics</i>					
Valuing learning at work	275	4.17	0.42	5	.63
Social Integration Manager	272	4.03	0.43	5	.87
Social Integration Colleagues	272	4.03	0.43	5	.76
Experience of Competence	272	4.02	0.39	7	.76
<i>Informal learning</i>					
Learning from experts	273	2.75	1.10	3	.73
Learning in interaction with peers	267	2.6	0.94	9	.88
Learning together	271	2.55	1.02	3	.70
Learning individually	266	2.28	1.13	4	.72
Learning in interaction with novices and outsiders	254	1.7	0.75	10	.84

Regression analyses were performed with the five informal learning scales as dependent variables (Table 5). In these analyses, the following learning worker background variables were included; gender, age, non-police education, police education, job level, job tenure, police tenure, and hours spend on jobs besides police work. Results show that all work practice characteristics play a role in predicting informal learning except for work pace. Specifically, collegial availability is a significant predictor for learning in interaction with people within the vocational practice (experts, peers and together). External input is a significant predictor for learning in interaction with peers, novices and outsiders and individually. The learning worker characteristic valuing informal learning is a significant predictor for learning in interaction with peers and individually, whereas experience of competence and social integration with manager are not significant for any of the informal learning scales. Several background variables appear to play an important role as well, such as police tenure, hours spend on jobs besides police work, and gender, whereas job level and education do not.

Conclusions

Background variables, work practice and individual characteristics are significant predictors for five types of informal learning. Negative moderate correlations existed between police tenure and learning from experts, peers and individually, indicating that police officers with a long history in police work score low on these informal learning scales whereas police officers with less years of experience in police work score higher on informal learning. Therefore it is appropriate to recognize its potential influence on the amount of informal learning. Positive moderate correlations between collegial availability, external input and informal learning indicate that these variables are important to the amount of informal learning. These findings support the empirical work of others (Billett, 2002; Eraut et al., 1998; Kwakman, 1999; Onstenk, 1997). Furthermore the positive correlation between hours spend on other jobs besides police work and learning individually suggests tentative support for the assumption that learning is supported by a change in the composition of social network, a network that is not part of the primary professional practice (Vandenabeele & Wildemeersch, 1998). The suggestion that kinds of practical work activities people perform in terms of task variation and autonomy influence learning (Billett, 2002; Ellström, 2001; Engeström, 1999; Kwakman, 1999; Onstenk, 1997; Straka, 2000) was supported for respectively learning together and learning in

interaction with novices and outsiders. Furthermore, work pace, experience of competence and social integration with manager did not correlate significantly to any of the informal learning scales. The low correlation between valuing learning at work, social integration with colleagues, management support and informal learning scales confirms that these are important aspects for some types of informal learning. In previous research this relationship was also specific for some kinds of learning activities, such as, 'participation in innovation and decision making' (Woerkmom, 2003) or interest and emotional dimensions of self-directed learning (Straka, 2000).

Table 5. *Regression Results With Five Informal Learning Scales as Dependent Variables and Work Practice and Learning Worker Characteristics and Background Variables as Independent Variables for Total Sample (N= 237)*

Dependent variable	Adjusted R-square	Predictor	Beta
Learning from experts	.34	Collegial availability	.29
		Police tenure	-.35
		Management support	.18
Learning in interaction with peers	.23	Collegial availability	.16
		Police tenure	-.26
		External input	.23
		Valuing informal learning	.19
Learning together	.19	Collegial availability	.26
		Task variation	.18
		Social integration colleagues	.15
Learning individually	.23	External input	.27
		Hours spend in side jobs	.20
		Police tenure	-.22
		Gender (1=male, 2=female)	-.16
		Valuing informal learning	.13
		Task autonomy	-.21
Learning in interaction with novices and outsiders	.18	External input	.43
		Task autonomy	-.21

Implications and Future Steps

The findings of preliminary analyses of this study contribute to the HRD profession through the presentation and evaluation of a descriptive typology of informal learning grounded in theory and previous research in education, psychology and organizational behavior. An indication of relevant predictors of different kinds of informal learning is presented that may generate ideas for HRD practitioners to optimize informal learning as well as for researchers to consider prevalent factors in affecting the amount of informal learning. The following step in this particular research project will be directed at structural equation modeling.

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